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### FACSIMILE COVER SHEET

**Examiner:** Office of Initial Patent Examination  
Customer Service Center

**Date:** December 7, 2004

**Client Code:** 1086

**Facsimile No.:** 703-746-9195

**From:** Troy T. Svihl, Esq.

**Subject:** Request for Corrected Filing Receipt  
**Docket No.:** 1086.2017-001  
**Applicants:** Qingsheng Zheng, *et al.*  
**Application No.:** 10/804,828  
**Filing Date:** March 19, 2004

Number of pages including this cover sheet: 6

Please confirm receipt of facsimile: Yes X No     

**Sir:**

Please see attached Request for Corrected Filing Receipt for Utility Application with attached edited Updated Filing Receipt and page one of the Specification of the Utility Application.

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Qingsheng Zheng, Magiel J. Harmse, Kent Rasmussen, and Blaine McIntyre  
Application No.: 10/804,828 Group: 2121  
Filed: March 19, 2004 Examiner: Not Assigned  
Confirmation No.: 7115  
For: METHODS AND ARTICLES FOR DETECTING, VERIFYING, AND  
REPAIRING COLLINEARITY IN A MODEL OR SUBSETS OF A MODEL

<b>CERTIFICATE OF MAILING OR TRANSMISSION</b>	
I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as First Class Mail in an envelope addressed to Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, or is being facsimile transmitted to the United States Patent and Trademark Office on:	
12-7-04	<i>Denise Caredeo</i>
Date	Signature
<i>Denise Caredeo</i>	
Typed or printed name of person signing certificate	

REQUEST FOR CORRECTED FILING RECEIPT  
FOR UTILITY APPLICATION

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

We hereby request that the following items of information be corrected to the Filing Receipt for the subject application received in this office on August 30, 2004.

The errors and corrections appear below.

**The name of the first inventor was mistyped on the filed Declaration and appeared also on the Corrected Filing Receipt. The correct spelling of the name is Qingsheng Zheng, as it appeared on the first page of the filed specification.**

10/804,828

-2-

Enclosed are copies of the Filing Receipt with changes noted in red and a copy of the first page of specification.

Pursuant to instructions in the February 29, 2000 O.G., we hereby request that the errors which are identified above be corrected in the captioned application to which this request for correction is directed. It is understood that the Patent Office will issue an automatically-generated, corrected Filing Receipt in this and, if applicable, any other affected applications.

Respectfully submitted,

HAMILTON, BROOK, SMITH & REYNOLDS, P.C.

By 

Troy T. Svihl

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Concord, MA 01742-9133

Date:

Dec. 7, 2004



## UNITED STATES PATENT AND TRADEMARK OFFICE

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APPL NO.	FILING OR 371 (C) DATE	ART UNIT	FIL FEE REC'D	ATTY DOCKET NO	DRAWINGS	TOT CLMS	IND CLMS
10/804,828	03/19/2004	2121	1202	1086.2017-001	8	32	4

021005  
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CONFIRMATION NO. 7116

## UPDATED FILING RECEIPT



\*OC000000013660171\*

Date Mailed: 08/27/2004

Receipt is acknowledged of this regular Patent Application. It will be considered in its order and you will be notified as to the results of the examination. Be sure to provide the U S APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION when inquiring about this application. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. If an error is noted on this Filing Receipt, please write to the Office of Initial Patent Examination's Filing Receipt Corrections, facsimile number 703-746-9195. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections (if appropriate).

## Applicant(s)

Qinsheng Zheng, Sugar Land, TX,  
 Magiel J. Harmse, Cambridge, UNITED KINGDOM;  
 Kent Rasmussen, Clinton, WA;  
 Blaine McIntyre, Cochrane, CANADA,

## Domestic Priority data as claimed by applicant

This appln claims benefit of 60/457,060 03/21/2003

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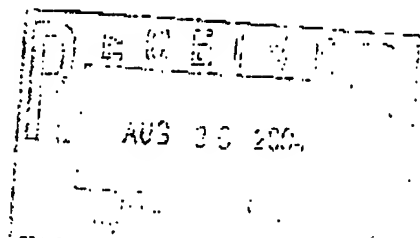
## Foreign Applications

If Required, Foreign Filing License Granted: 06/01/2004

Projected Publication Date: 12/09/2004

Non-Publication Request: No

Early Publication Request: No



## Title

Methods and articles for detecting, verifying, and repairing collinearity in a model or subsets of a

model

Preliminary Class  
700

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Title 37, Code of Federal Regulations, 5.11 & 5.15**

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- 1 -

Date. MARCH 19, 2004 Express Mail Label No. EV 052031493 US

Inventors: Qingsheng Zheng, Magiel J. Harmse, Kent Rasmussen,  
and Blaine McIntyre

Attorney's Docket No.: 1086.2017-001

**METHODS AND ARTICLES FOR DETECTING, VERIFYING, AND REPAIRING  
COLLINEARITY IN A MODEL OR SUBSETS OF A MODEL**

**RELATED APPLICATION**

This application claims the benefit of U.S. Provisional Application No.  
5 60/457,060, filed on March 21, 2003. The entire teachings of that application are  
incorporated herein by reference.

**BACKGROUND OF THE INVENTION**

Model Predictive Control (herein referred to as "MPC") is a technology utilized  
in various Advanced Process Control (herein referred to as "APC") systems. MPC-  
10 based systems have been implemented on thousands of refining and chemical processes  
over the past two decades. DMCplus®, and the earlier version, DMC, (both available  
from Aspen Technology, Inc. of Cambridge, Massachusetts) is a widely used MPC-  
based system. In an MPC-based system, a model is used to predict the future behavior  
of a process, given the current and history input information (e.g., measurements of  
15 process conditions). An optimized control plan is calculated such that the predicted  
future response and the control action needed to achieve the response will satisfy certain  
predefined criteria. Once the calculated control plan is implemented (e.g., after the first  
point of the control move is implemented), the process measurements are collected and  
fed back to the controller to update the model predictions. A new control plan  
20 calculation is then initiated.

In an MPC-based controller, the model plays a central role. The model not only  
dictates the accuracy of the predictions, but it also affects the control actions. Model